DETAILED ACTION

1. A **request for continued examination** under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 30 September has been entered.

2. Claims 1, 3-5 and 7-8 have been presented for examination.

Response to Arguments

3. Applicant's arguments with respect to the prior art rejection have been fully considered but they are not persuasive.

i. **Applicant submits,** on page 7 of the remarks, regarding claims 1 and 5, that "...the predictable breakpoint in section 4.1 and the unpredictable breakpoint in section 4.2 are simply points in time. There is no description is sections 4.1 and 4.2 of generating from the first source code a fifth source code of an event control program which calls a function of activating or deactivating the continuous system equations when the first event is occurred."

Examiner notes that sections 4.1 and 4.2 disclose the aforementioned breakpoints. As stated in section 3.1, when a breakpoint occurs, the simulation and solving of the ODEs (analogous to the claimed system equations), and the numerical integration formula are both stopped. This is analogous to the deactivation of the system equations. Section 3.1 further states, in regards to the breakpoints, that breakpoints are the time points that may be the result of the vector itself, the discontinuity of the input signal, or the discrete state transitions (which are caused by events). Therefore, these breakpoints can be dependent of the occurrence of the claimed events.

ii. **Applicant submits,** on page 8 of the remarks, claims 1 and 5, "More specifically, there is no source code described in section 4.1 or 4.2".

Examiner notes that "source code" is human-readable program statements written by a programmer or developer in a high-level or assembly language that are not directly readable by a computer. The method described in Liu is a hierarchical hybrid system modeling and

simulation framework using the Ptolemy II environment, which is a system-level design tool. The code comprising the system description and simulation would therefore be source code.

iii. **Applicant submits,** on page 8 of the remarks, claims 1 and 5, "Finally, there is no description of generating a fifth source code of an event control program."

Examiner notes that Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

iv. **Applicant submits,** on page 8 of the remarks, claims 1 and 5, that section 4.3 contains no description of the generation of a source code of an event control program which calls an additional process when the second event is occurred.

Examiner notes that section 4.3 discloses an automation system that can take the state transition whenever a guard is evaluated to be true. This guard is determined by a calculation based on the occurrence of an event (see equation 9). Thus, based on the event occurrence, a state transition takes place.

v. **Applicant submits,** on pages 8-9 of the remarks, that Examiner's interpretation of Liu is internally inconsistent because sections 4.1 and 4.2 are cited for both the 2nd and 6th limitations, and that section 4.3 is cited for both 4th and 6th limitations, while the claim language makes it clear that the first source code is different from the fifth source code and that the third source code is different from the fifth source code.

Examiner notes that it cannot be assumed that the each of the sections discloses only one type of source code. For example, sections 4.1 and 4.2 each disclose types of events (analogous to the second limitation), and state that these events result in breakpoints. Each of these would be different source code, since the same code cannot be used to define both an event and a breakpoint. Examiner has cited section 4.3 for both the 4th and 6th limitations because these limitations both refer to the "additional process". Examiner has mapped the

limitations to individual sections, and has also specifically stated the relevance of each of the sections.

vi. Applicant submits, on page 9 of the remarks, that "There is no description in Liu of executing an additional processing program based on the sixth source code, using the same program source as the hybrid model, wherein a control signal including the data is exchanged to/from the mechanism control software as recited in Claims 1 and 5."

Examiner notes that Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on 30 September 2008 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1, 3-5 and 7-8 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by **Liu ("A Hierarchical Hybrid System Model and Its Simulation"**, 1999**).**

Regarding claims 1 and 5:

Liu discloses a simulation method of simulating a behavior of a mechanism to be simulated along a time axis on the basis of description data using a hybrid model, comprising:

a. parsing a source program of a hybrid model of the mechanical device, the source program including (**Introduction**):

b. a first source code defining a hybrid model language occurrences of first and second events **(sections 4.1 and 4.2:** predictable and non-predictable events)

c. a second source code defining in the hybrid model language continuous system equations **(section 2.2 " 'open' continuous subsystem with the form of a set of ordinary differential equations")** that are activated or deactivated upon occurrences of the first event **(sections 4.1 and 4.2: events results in breakpoints)**

d. a third source code defining an additional process which is called when the second event is occurred **(section 4.3 state transitions)**

e. generating from the second source code a fourth source code of a model equation registration program which converts data structures of all the continuous system equations into tree structures as internal data representations **(section 2: "hierarchical automata modeling" the system is expressed as a hierarchical (i.e. tree) organization of executable entities that are simulated)**

f. generating from the first source code a fifth source code of an event control program which calls a function of activating or deactivating the continuous system equations when the first event is occurred **(sections 4.1 and 4.2: events results in breakpoints)**, and calls the additional process when the second event is occurred **(section 4.3: when appropriate events occur there is a discrete state transition)**

g. from the third source code a sixth source code of additional processing program which is called in the event control program **(section 4.3 state transitions)**

h. executing a model equation registration program based on the fourth source code **(section 2: "hierarchical automata modeling" the system is expressed as a hierarchical (i.e. tree) organization of executable entities that are simulated)**

i. executing the simulation to output data that expresses the behavior of the mechanism **(section 5 steps 1-4)**, wherein the activated one of the continuous system equations is solved by numerical integration along the time axis according to the converted data structure **(sections 3 and 3.1)**

j. executing an additional program based on the sixth source code, using the same program source as the hybrid model **(abstract: entire simulation performed in Ptolemy)** wherein a control signal

including the data is exchanged to/from the mechanism control software (**"Introduction": 4th paragraph; section 6.3)**

Regarding claim 5, the simulation of the prior art is run through the Ptolemy II software (**abstract**).

Regarding claims 3 and 7:

Liu discloses the method according to claim 1, further comprising: exchanging a control signal with an external system through an input/output port in accordance with the additional processing program, the external system including a mechanism control software system that control the mechanism **("Introduction": 4th paragraph; section 6.3)**

Regarding claims 4 and 8:

Liu discloses the method according to claim 1, wherein the first event contains an evaluation result of internal variables of the mechanism **(section 5 steps 1-4).**

Conclusion

6. **Examiner's Remarks:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shambhavi Patel whose telephone number is (571) 272-5877. The examiner can normally be reached on Monday-Friday, 8:00 am – 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Kamini S Shah/

Supervisory Patent Examiner, Art Unit 2128